ABSTRACT

A novel solution to fast network restoration is provided. In a network node, dedicated hardware elements are utilized to implement restoration, and these elements are linked via a specialized high speed bus. Moreover, the incoming and outgoing optical signals to each input/output port are continually monitored and their status communicated to such dedicated hardware via the high-speed bus. This provides a complete snapshot in virtually real time of the state of each input port on the node, and the switch map specifying the inter portal connections, to the dedicated control and restoration hardware. The specialized hardware detects trouble conditions and reconfigures the switching fabric. The invention enables a very fast and efficient control loop between the I/O ports, switch fabrics, and controllers.

In a preferred embodiment the hardware comprises a Connection Manager and an Equipment Manager. The switching fabric control is also linked via the same high-speed bus, making changes to input/output port assignments possible in less than a millisecond and thus reducing the overall restoration time. In a preferred embodiment the status information is continually updated every 125 microseconds or less, and the switch fabric can be reconfigured in no more than 250 microseconds from occurrence of a trouble condition.